THE USE OF SCORM SPECIFICATION IN DESIGNING REUSABLE LEARNING CONTENT

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UNIVERSITI UTARA MALAYSIA 2005

The Use of SCORM Specification in Designing Reusable Learning Content

This thesis is presented to the Faculty of Information Technology
in fulfillment of the requirements for
Master of Science (Information Technology)
Universiti Utara Malaysia

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ABSTRAK

Penggunaan WWW yang meluas untuk tujuan pendidikan mencipta peluang-peluang dalam menggunakan semula sumber-sumber yang ada. Sebelum ini, kebanyakan sumber dihasilkan untuk tujuan yang tertentu dan dalam konteks yang tertentu contohnya latihan ketenteraan, penyeliaan pekerja dan komuniti latihan. Cara merekabentuk sumber ini menghalang sumber tersebut untuk diguna semula untuk tujuan pembelajaran yang lain. Selain daripada itu, keperluan sesuatu piawaian dalam merekabentuk sumber yang boleh diguna semula dapat membantu dalam penghasilan sumber e-pembelajaran yang berkualiti. SCORM merupakan satu set spesifikasi untuk pembangunan, pempakejan, dan penghantaran sumber-sumber pembelajaran dan latihan yang berkualiti tinggi pada ketika dan di mana ia diperlukan. Penggunaan SCORM spesifikasi dalam merekabentuk dan penggunaan semula sumber memberi kesan dalam pembangunan sumber pendidikan yang menepati piawaian SCORM yang bagus dan berpotensi. Oleh itu, penyelidikan ini dijalankan bertujuan untuk menghasilkan satu model proses untuk merekabentuk kandungan pembelajaran yang boleh diguna pakai. Sumber pembelajaran yang sedia ada direkabentuk semula berpandukan kepada model proses untuk meningkatkan kebolehgunaan sumber pembelajaran ini. *Test Suite* telah digunakan bagi menentukan sumber pembelajaran yang telah dibangunkan mematuhi SCORM spesifikasi. Berdasarkan kepada keputusan pengujian, satu senarai elemen-elemen yang diperlukan dalam menyediakan kandungan yang mematuhi SCORM telah dikenalpasti. Langkah-langkah yang digunakan dalam pembangunan sumber pembelajaran akan digunakan sebagai panduan dalam penyediaan dan pembangunan sumber pembelajaran yang berkualiti dan dapat dikongsi di antara LMS yang lain. Dengan menggabungkan penggunaan teknologi XML, ia membuka satu peluang yang besar dalam merekabentuk dan mempersembahkan sumber-sumber yang berkualiti tinggi untuk tujuan pendidikan dan latihan disamping memainkan peranan penting dalam pertukaran pelbagai jenis data dalam Web.

ABSTRACT

The widespread use of WWW for educational purposes creates opportunities in reusing educational materials. In the past, most of the learning materials are created for a specific purpose in a specific context such as for military training, employees' supervisions, and training community. The way of designing this material restricted the material to be reusable in other educational purpose. Besides, the need for a standard in designing reusable learning material helps to produce quality e-learning experiences. SCORM is a set of specifications for developing, packaging, and delivering high quality educational and training materials whenever and wherever it is needed. The use of SCORM specification in designing and reusing learning material impacted the development of potential and good SCORM-compliant learning material. Therefore, this research is undertaken to produce a process model in designing reusable learning content. Existing material is redesigned based on the proposed process model in order to increase the reusability of the learning material. A Test Suite was used to determine the conformance of developed learning content to the SCORM Specification. Based on the results, a list of needed elements to develop SCORM-compliant content was outlined. The steps used in the learning content development process model can be used as a guideline in creating a quality learning material that can be shared among other LMS. Together with the use of XML technology, it opens a wide spectrum of possibilities for design and presentation of high quality materials for a particular education or training purpose and plays an important role in the exchange of wide variety of data on the Web.

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful.

My heartiest gratitude goes to:

The Ministry of Science and Technology for the financial support.

Universiti Utara Malaysia for the facilities and resources provided.

My supervisor, Prof. Dr. Ku Ruhana Ku-Mahamud for her consistent supports and guidance throughout my research work. Despite her busy schedules, Prof. Ku Ruhana has given me her time for comments and suggestions of this research.

My advisors, Mr. Helmi Mohamed Hussain and Prof. Dr. Abu Talib, who introduced me to the research world, specifically to XML technology and taught me to be passionate about it.

My family, who have supported and buoyed me up with love, patience and understanding throughout my study, without whose help and unending generosity none of this would have been conceivable.

My research clique especially 'XMLers'; Maz, Buha, Aya, and K'Dilah for their support and encouragement and also the precious moment we shared together.

And all the individuals involved in the establishment of this research.

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LIST OF ABBREVIATIONS

ADL	Advanced Distributed Learning
AICC	Aviation Industry CBT Committee
API	Application Program Interface
ARIADNE	Alliance of Remote Instructional Authoring and Distribution Networks for Europe
CAM	Content Aggregation Model
CP	SCORM Content Packaging
CSS	Cascading Style Sheet
DoD	Department of Defense
HTML	Hypertext Markup Language
IEEE	Institute of Electrical and Electronics Engineers
IMS	IMS Global Learning Consortium
LMS	Learning Management Systems
LOD	Learning Object Development
LOM	Learning Object Meta-data
LSAL	Learning Systems Architecture Lab of Carnegie Mellon University
LTSC	Learning Technology Standards Committee
PIF	Package Interchange File
POOL	Portal for Online Objects in Learning
RIO	Reusable information objects
RLO	Reusable Learning objects
SCO	Sharable Content Object
SCORM	Sharable Content Object Reference Model
SGML	Synchronize Generalized Markup Language
WWW	World Wide Web
XML	Extensible Markup Language

CHAPTER 1
INTRODUCTION

The Internet and especially the World Wide Web (WWW) became popular in the second half of the 1990s as a vehicle to deliver instruction thus increased the opportunities for reusing learning material (Hiddink, 2001b). Reusability is the degree to which a software module or other work product can be used in more than one computing program or software system (IEEE, 1990). The Web is abounding with products and resources that have been developed for use in single settings and the prospect of reusing these resources in other settings appears to provide more changes. Reusable resources are needed to make it sharable between other applications or systems.

There are many factors that inhibit or reduce the reusability of learning material. Hiddink (2001b), in his research on reusability problems of online learning materials modeled the factors that are hypothesized to influence the reusability of learning material. There are three global factors that determine the reusability which are accessibility, genericity, and opportunity. In education, learning material is mostly designed to meet the requirement of specific course. The way of designing the material in such way restricted instructors and teachers to adapt the context of learning object to a new context. So, designing the learning material for reuse will increase the reusability of a learning object.

Besides, the need of a standard in creating reusable learning material also helps in creating quality content that can be shared among learning management systems or various applications. There are many projects that are exploring this area of interest. Advanced Distributed Learning (ADL) developed guidelines needed for large-scale development and implementation of efficient and effective distributed learning. ADL has defined a Sharable Content Object Reference Model (SCORM) that meets

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